

81

ABSTRACT

A radioactive emission probe in communication with a position tracking system and the use thereof in a variety of systems and methods of medical imaging and procedures, are provided. Specifically, wide-aperture collimation - deconvolution algorithms are provided, for obtaining a high-efficiency, high resolution image of a radioactivity emitting source, by scanning the radioactivity emitting source with a probe of a wide-aperture collimator, and at the same time, monitoring the position of the radioactive emission probe, at very fine time intervals, to obtain the equivalence of fine-aperture collimation. The blurring effect of the wide aperture is then corrected mathematically. Furthermore, an imaging method by depth calculations is provided, based on the attenuation of photons of different energies, which are emitted from the same source, coupled with position monitoring.